



**Supplementary information, Figure S4** The *rig1,2,3,4,5* quintuple mutant showed a phenotype similar to the null alleles of the components in RGF1-PLT pathway.

(A) Phenotypes of Col-0, *rig1,2,3,4*, *rig1,2,3,4,5*, *tpst-1*, WS2, and *plt1-4 plt2-2*. Seven-day-old

seedling were used for photographing. Size bar represents 5 mm.

(B) Measurement of the root length of Col-0, *rig1,2,3,4*, *rig1,2,3,4,5*, *tpst-1*, WS2, and *plt1-4 plt2-2*. The data shown is the average and SD (n>30).

(C) PI stained root tip confocal images of Col-0, *rig1,2,3,4,5*, *tpst-1*, WS2, and *plt1-4 plt2-2*.

Five-day-old seedlings were used for analysis. Size bar represents 50  $\mu$ m. White arrow heads indicate the junctions between meristem and elongation zones.

(D) Measurements of meristematic cortex cells of Col-0, *rig1,2,3,4,5*, *tpst-1*, WS2, and *plt1-4 plt2-2*. The data shown is the average and SD (n>15).

(E) Phenotypes of Col-0, *rig1,2,3,4,5*, *tpst-1*, and *rig1,2,3,4,5 tpst-1*. Five-day-old seedlings were used for photographing. Size bar represents 5 mm.

(F) Measurements of the root length of Col-0, *rig1,2,3,4,5*, *tpst-1*, and *rig1,2,3,4,5 tpst-1*. The data shown is the average and SD (n>40).